1997 Employer Wage Survey

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TABLE OF CONTENTS

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Occupational Employment and Wage, 1997 Technical Notes

General Overview of Survey Design

The Occupational Employment Statistics (OES) survey is an annual mail survey measuring occupational employment and wage rates for wage and salary workers in nonfarm establishments, by industry. In cooperation with the Bureau of Labor Statistics, the Arizona Department of Economic Security, Research Administration contacts approximately 6,000 establishments annually. The reference period for each year's survey is the fourth quarter of that year. While estimates can be made from a single year of data, the OES survey has been designed to produce estimates using a three-year sample cycle. (See Estimation Methodology section.) The complete three-year sample allows the production of estimates at fine levels of geography, industry, and occupational detail. Every fourth year, the oldest sample is replaced by the most recent sample creating a "moving" three-year cycle. This survey design began in 1996. Each annual survey requires a 75 percent response.

BLS and the Employment and Training Administration (ETA) provide the funding for the survey. BLS provides the procedures and technical support, while the State Employment Security Agencies (SESAs) collect the data. The SESAs produce industry-specific estimates for states and local areas. BLS produces industry estimates for the nation, and cross-industry estimates for the nation, states, and metropolitan statistical areas (MSAs).

The OES survey defines employment as the number of workers who can be classified as full-time or part-time employees; workers on paid vacations or other types of leave; workers on unpaid short-term absences; salaried officers, executives, and staff members of incorporated firms; employees temporarily assigned to other units; and employees for whom the reporting unit is their permanent duty station regardless of whether that unit prepares their paycheck. The survey excludes the self-employed, owners/partners of unincorporated firms, and unpaid family workers. Employees are reported in the occupation in which they are working, not necessarily for which they were trained.

The OES survey currently uses the Standard Industrial Classification (SIC) system to classify all establishments. An establishment is defined as an economic unit that processes goods or provides services, such as a factory, mine, or store. The establishment is generally at a single physical location and is engaged primarily in one type of economic activity. The scope of the survey includes establishments in agricultural services; mining; construction; manufacturing; transportation and public utilities; wholesale and retail trade; finance, insurance, and real estate; services; and government.

States' Unemployment Insurance (UI) files provide the universe from which the OES survey draws its sample. The industry employment benchmarks are obtained from reports submitted by employers to the UI program. In some nonmanufacturing industries, supplemental sources are used for establishments not reporting to the UI program (railroad workers for instance).

All areas, industries, and firm sizes are sampled. Reporting units with 250 or more employees are sampled with certainty across a three-year cycle; however, during any one survey year, only one-third of the certainty units are in the sample.

The OES classification system uses seven occupational divisions to categorize workers in one of over 770 detailed occupations. The seven divisions are as follows:

1. Managerial and administrative occupations
2. Professional, paraprofessional, and technical occupations
3. Sales and related occupations
4. Clerical and administrative support occupations
5. Service occupations
6. Agriculture, forestry, fishing, and related occupations
7. Production, construction, operating, maintenance, and material handling occupations.

Concepts

The OES survey form sent to an establishment contains between 50 and 225 OES occupations selected on the basis of the industry classification and size class of the sampled establishments. To reduce paperwork and respondent burden, no survey form contains every OES occupation. Thus, data for specific occupations are collected from establishments within industries that are the predominant employers of labor in those occupations.

Wages for the OES survey are straight-time, gross pay, exclusive of premium pay. Base rate, cost-of-living allowances, guaranteed pay, hazardous-duty pay, incentive pay including commissions and production bonuses, and on-call pay are included. Excluded are back pay, jury duty pay, overtime pay, severance pay, shift differentials, nonproduction bonuses, and tuition reimbursements.

Wage Definitions

The mean wage is the estimated total wages for an occupation divided by its weighted survey employment. With the exception of the lower and upper open-ended wage intervals, a mean wage value is calculated for each of 11

wage intervals (see followingtable) based on occupational wage data collected by the Bureau's Office of Compensation and Working Conditions. The mean wage value for the upper open-ended wage interval is its lower bound ($60.01) while the mean wage for the open-ended low range is $5.74 (Winsorized means). These interval mean wage values are then weighted by all workers reported in the interval. For each occupation, total weighted wages in each interval are summed across all intervals and divided by the occupation's weighted survey employment.

Percentile wages reflect the percent of jobs above or below the stated percentile. The twenty-fifth percentile reflects that 25 percent are paid less and 75 percent are paid more. Conversely, the seventy-fifth reflects that 75 percent are paid less and 25 percent are paid more. The median is the fifty percent wage; half are paid more and half are paid less.

Wage Intervals in Survey

Interval	Hourly	Annual
Range A	Under $5.75	Under $11,960
Range B	$5.75 to $8.49	$11,960 to $17,679
Range C	$8.50 to $9.99	$17,680 to $20,799
Range D	$10.00 to $11.24	$20,800 to $23,399
Range E	$11.25 to $13.24	$23,400 to $27,559
Range F	$13.25 to $15.74	$27,560 to $32,759
Range G	$15.75 to $19.24	$32,760 to $40,039
Range H	$19.25 to $24.24	$40,040 to $50,439
Range I	$24.25 to $43.24	$50,440 to $89,959
Range J	$43.25 to $60.00	$89,960 to $124,819
Range K	$60.01 and over	$124,820 and over

Estimation Methodology Details

Each annual sample represents a one-third sample of strata for the full three-year sample plan. While estimates can be made from a single year of data, the OES survey has been designed to produce estimates using the full three years of data. Estimates using any one year of data would be subject to a higher sampling error (due to the smaller sample size) and the limitations associated with having only one third of the units from the certainty strata. Producing estimates using the three years of sample data provides significant sampling error reductions (particularly for small geographic areas and occupations); however, it also has some quality limitations in that it requires the adjustment of earlier years' data to the current reference period--a procedure referred to as "wage updating."

While there are significant advantages, there are also limitations associated with this estimation procedure in that it requires "wage updating" for the earlier years of data. For "wage-updating" purposes, the Bureau has used the national Employee Cost Index over-the-year wage changes from the fourth quarter of 1996 to the fourth quarter of 1997. Such a procedure assumes that each occupation's wage, as measured in the earlier years, moves according to the average movement of its occupational division and that there are no major geographic differences--and this may not be the case. As noted below, the Bureau will be conducting research over the next several years on the accuracy of this approach and also on other modeling approaches that may produce more accurate results.

- 1996 OES Survey Estimates: The 1996 OES survey estimates, which were published in December 1997, were from the first year of the new OES wage survey and were developed using only a single year (i.e., 400,000 sample units) of data. The initial estimation methodology used a weighting-class adjustment procedure for nonrespondents and an employment benchmark at the state/industry level. Since multiple years were not available for the 1996 data, the estimation procedure did not involve "wage updating."

- 1997 OES Survey Estimates: The 1997 OES survey estimates represent the second year of OES estimates and have been developed using both 1996 and 1997 survey data that, when combined, cover approximately 800,000 sample units. The 1997 estimates also represent the first year of using a "wage-updating" methodology in developing the OES survey estimates. For the 1997 estimates, the OES program has used the over-the-year fourth quarter wage changes from the Bureau's Employment Cost Index to adjust the 1996 survey data before combining it with this year's fourth quarter 1997 data. In addition to the wage-updating procedure, the 1997 estimates use an improved estimation methodology, which uses a "nearest neighbor" imputation approach for nonrespondents and applies employment benchmarks at a detailed MSA by three-digit industry and broad size class level. *Note: Because of the difference in estimation methods for these first two years of OES estimates, the data from 1997 are not strictly comparable with those published from 1996.*

Future Research

The expanded OES survey is a relatively new program, and the Bureau has a number of research efforts underway. Some areas of future research are given below.

- Sample Design Research: The Bureau is evaluating the feasibility of collecting all certainty units (i.e., large employers of 250+) every year so that more accurate independent estimates from a single year of sample

data can be produced. These estimates will not contain possible effects from the "wage-updating" procedure and can provide an independent measure of the accuracy of the updating procedure along with the ability to use this data directly for more aggregate levels of publication. Inclusion of certainty units in each year's sample also will enable the Bureau to explore alternative "wage-updating" procedures using the new OES data itself in the updating process.

- Collection Methodology Research: This includes cognitive research on improvements to form design and alternative electronic collection reporting procedures for respondents.

- Estimation Methodology Research: An important research effort over the next several years will be the evaluation of the current "wage-updating" methodology along with the identification of alternative modeling approaches may produce improved overall accuracy. An additional area of research will be to extend the Bureau's earlier 1992 and 1996 research on estimation methods for workers who fall in the upper-and lower-end wage intervals.

Additional Information

For additional information, contact Arizona Department of Economic Security, Research Administration, (602) 542-3871. See also, http://stats.bls.gov/oeshome.htm or contact the Office of Employment and Unemployment Statistics, Occupational Employment Statistics, Room 4840, 2 Massachusetts Avenue, NE, Washington DC, 20212, telephone 202-606-6569(e-mail: oesinfo@bls.gov).

Employers Unlikely to See Any Relief from 5-6% Wage Increases in 1999

Despite Arizona's stellar performance as a creator of jobs during the 90's, worker's purchasing power appears to have benefited little. Arizona non-farm wage growth rates have surpassed national wage growth since 1993. Disposable income (after-tax income) growth as well has generally been better than its national counterpart. But, these growth rates have been insufficient to overcome local inflation. As a result, Arizonan's purchasing power has actually been declining or negligible both in terms of inflation adjusted wages and disposable income measures.

As charts below show, non-farm real (inflation adjusted) wage growth was negative or negligible every year from 1992 through 1996. Real disposable income growth has most often been negative or at best lagging the national rates by a percentage point or more … only 1998 looks good after adjustment of the Phoenix Metropolitan CPI for methodological differences from federal methods. Non-farm wages for 1998 will not be available until mid-1999. However, 1998 real wage growth should be the best Arizona has experienced since 1992.

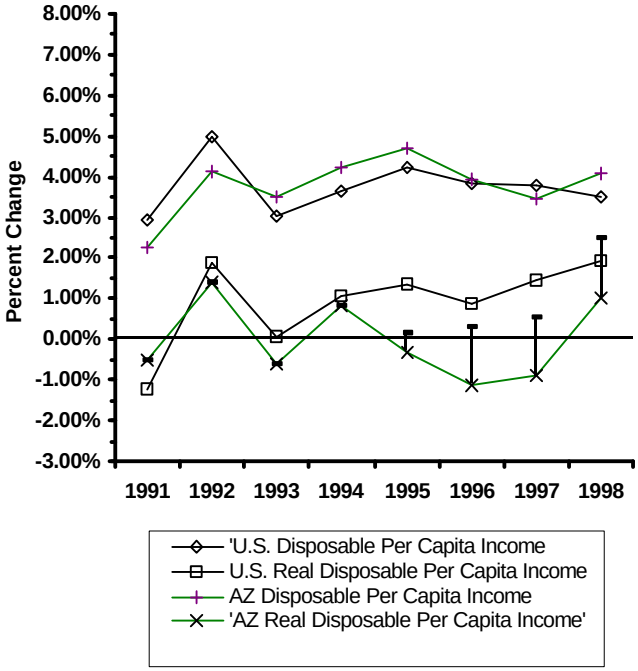
Employer Wage Adjustment Practices

Why aren't Arizonans benefiting more from one of the nation's longest running economic expansions in history. It's certainly not the personal tax burden effect on real disposable income. Arizona consistently ranks from 36th to 38th in the nation as measured by multiple taxation indicators.[1] As measured by Arizona State University's Metropolitan Phoenix consumer price index local inflation has been greater than the national rate. Human resource managers typically look at three primary factors when adjusting wages.[2]

1) What other employers are paying
2) Cost-of-living indexes
3) The firm's financial results

What other employers pay can be discovered in a variety of ways …. some sound and some loaded with bias. This issue was addressed in our analysis of the 1995 wage survey. Suffice it to say here that the best source is the local wage survey with the largest sample. Research Admini-

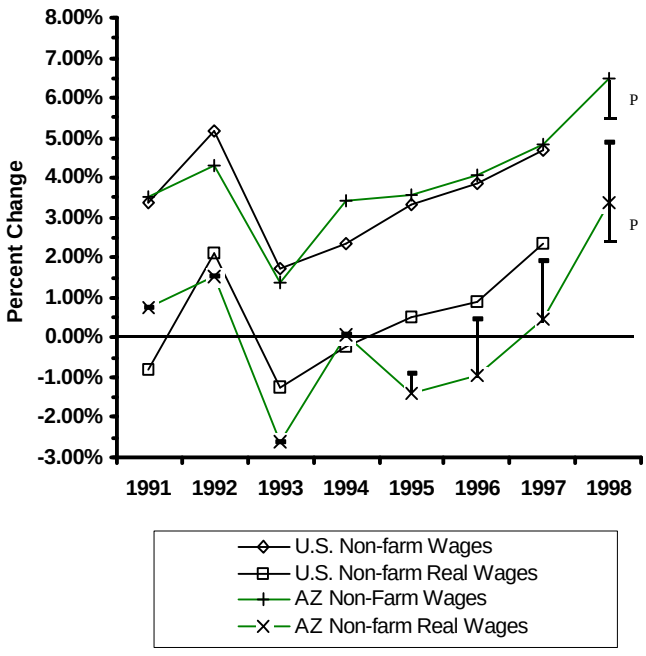
Comparison of Arizona Disposable Income Growth



Source: Bureau of Economic Analysis. Inflation adjusted series are author's calculations based on Arizona State University, Center for Business Research Phoenix Metropolitan CPI.

Adjustment range for methodological overstatement of 1.5 inflation points.[6] (see "References" on p. 6)

Comparison of Arizona Nonfarm Wage Growth



Source: Bureau of Economic Analysis. Inflation adjusted series are author's calculations based on Arizona State University, Center for Business Research Phoenix Metropolitan CPI.

P: Preliminary range estimate based on DES 1998 source data. U.S. data for 1998 unavailable.

Adjustment range for methodological overstatement of 1.5 inflation points.[6] (see "References" on p. 6)

stration's *1997 Employer Wage Survey* represents about 12,000 employers. Once about two to three percent of larger occupations' total employment (jobs employing 200+) has been sampled, the data stabilize and represent a very accurate picture of wage rates. As an indicator of reliability, our data reports the percent of total occupational employment that is represented in our sample.

Local information, even if the best and soundly applied, may not be used by many of the state's largest employers. This is because these firms tend to be nationally distributed and wage levels are often set by their national headquarters which tend to employ national average sources of information.[3] The local feedback may simply not be taken into account. While it's impossible to say how much this issue actually contributes to locally deficient wage gains, large employers (500+ employees) control 26.6 percent of total employment and 31.6 percent of the state's total wage and salary payroll.[4]

Cost-of-living indexes exist for a variety of measures. Comparison of local indexes versus national indexes demonstrate how ineffective wage adjustment decisions can be made when large differences exist between these measures. The cost-of-living measure most commonly applied to wage adjustments are consumer price indexes (CPI) and employment cost indexes. Until recently, Arizona State University's Center for Business Research produced a CPI for the metropolitan Phoenix area. This measure was discontinued after 1998 due to changes in the Federal methodology which could not be duplicated at the local level. The Bureau of Labor Statistics' CPI-U ('U' for "all urban consumers") is frequently used by employers in their salary adjustment procedure. This index is produced for the nation and selected geographic regions – the West for instance. Table 1 shows how these two measures have differed during the 90's.

The higher rates of inflation reflected by the Metropolitan Phoenix CPI aren't due solely to inherent differences in the two measures. Prior to the gradual changes in federal CPI methodology that have impacted the Phoenix CPI since 1995, Phoenix had a history of higher inflation during periods of economic expansion. The Bureau of Labor Statistic's CPI-u for the West has been growing faster than the national index during the last two years. The Bureau also conducted a feasibility test for a metropolitan employment cost index in Salt Lake City, Utah during 1996 and 1997.[5] The test results showed Salt Lake's index to be 0.7 percentage points greater than the national index. Thus, local inflation conditions play a key role in wage adjustment policy. Even though wages may rise competitively with national wage gains, if an understated cost index is employed in the analysis, real wage gains will not occur. Because Arizona will no longer have a measure of local inflation, it's going to be more difficult to determine if we're prospering or not.

Table 1

Year	Percent Change U.S. CPI-U	Percent Change Metro Phoenix CPI
1991	4.2	2.8
1992	3.0	2.7
1993	3.0	4.1
1994	2.6	3.3
1995	2.8	5.0
1996	3.0	5.1
1997	2.3	4.4
1998	1.4	3.0

Attempting to assess the contribution of business profits to Arizona wage growth is probably a futile exercise. Employer's only have to pay whatever it takes to keep adequately staffed … not what they could afford to pay. "Pay" can also take intangible forms embodied in quality-of-life and quality-of-employment measures (the latter was discussed in our 1995 survey). Evidently Arizona workers perceive themselves to be adequately compensated overall, otherwise the data suggest that we should be seeing an exodus of workers escaping their mostly declining fortunes. Now, across the nation, workers are feeling inflation's pinch on their purchasing power..[7] In conclusion, Arizona employers can expect demand for wage rate increases similar, if not greater, than recent years in 1999.

- *Chris Hedin, Labor Market Information Supervisor*

References

1. Arizona Tax Research Association, 1997.
2. Audrey Freedman in "The new Look in Wage Policy and Employee Relations," Report No. 865, The Con-ference Board, 1985.
3. Author's personal experience with local human re-source managers associated with nationally distrib-uted firms.
4. Arizona Department of Economic Security, Research Administration, May 1999.
5. Jason Ford in "Compensation and Working Condi-tions," Bureau of Labor Statistics, Winter 1998.
6. "Annual Average Inflation Rate Down a Little in 1997," *Arizona Business*, p.7, March 1998.
7. Inflation starts to Weigh on U.S.A., Beth Belton, *USA Today*, June 30, 1999.

1997 Wage Rates Around the State

In 1995 Research Administration published what we call a "market minimum wage." That is, a competitive low wage for minimal skill labor. The current survey provided us the first opportunity since then to repeat this report. Table below shows how the reported areas compare. In 1995 the Arizona minimum market wage was $5.60 per hour. Market minimum pay is quite consistent across areas except the Balance of State. The Balance of State market minimum pay is higher because of the region's "All Other" occupational categories. "All Other" occupational types capture emerging or less common types of jobs that have not been classified.

Area	Market Mininum Wage[1]	Average Hourly Wage of All Occupations
Arizona	$5.98	$13.08
Balance of State	$6.21	$11.62
Coconino County	$6.05	$11.49
Phoenix-Mesa MSA	$6.06	$13.55
Tucson MSA	$5.95	$12.46

1) Twenty-fifth percentile wage for occupations requiring less than one month of training. Excludes tipped and commissioned occupations.